WHAT IS CLAIMED IS:

1. A method for analyzing data from a glucose sensor, comprising:

monitoring a data stream from the sensor;

detecting transient non-glucose related signal artifacts in the data stream that have a higher amplitude than a system noise; and

replacing at least some of the signal artifacts using estimated glucose signal values.

2. The method of claim 1, wherein the data signal obtaining step comprises receiving data from one of non-invasive, minimally invasive, and invasive glucose sensor.

3. The method of claim 1, wherein data signal obtaining step comprises receiving data from one of an enzymatic, chemical, physical, electrochemical, spectrophotometric, polarimetric, calorimetric, iontophoretic, and radiometric glucose sensor.

4. The method of claim 1, wherein the data signal obtaining step comprises receiving data from a wholly implantable glucose sensor.

5. The method of claim 1, wherein the signal artifacts detection step comprises testing for ischemia within or proximal to the glucose sensor.

6. The method of claim 5, wherein the ischemia testing step comprises obtaining oxygen concentration using an oxygen sensor proximal to or within the glucose sensor.

7. The method of claim 5, wherein the ischemia testing step comprises comparing a measurement from an oxygen sensor proximal to or within the glucose sensor with a measurement from an oxygen sensor distal from the glucose sensor.

8. The method of claim 5, wherein the glucose sensor comprises an electrochemical cell comprising a working electrode and a reference electrode, and wherein the ischemia-testing step comprises pulsed amperometric detection.

9. The method of claim 5, wherein the glucose sensor comprises an electrochemical cell comprising working, counter and reference electrodes, and wherein the ischemia-testing step comprises monitoring the counter electrode.

10. The method of claim 5, wherein the glucose sensor comprises an electrochemical cell comprising working, counter and reference electrodes, and wherein the ischemia-testing step comprises monitoring the reference electrode.

11. The method of claim 5, wherein the glucose sensor comprises an electrochemical cell comprising an anode and a cathode, and wherein the ischemia-testing step comprises monitoring the cathode.

12. The method of claim 1, wherein the signal artifacts detection step comprises monitoring a level of pH proximal to the sensor.

13. The method of claim 1, wherein the signal artifacts detection step comprises monitoring a temperature proximal to the sensor.

14. The method of claim 1, wherein the signal artifacts detection step comprises comparing a level of pH proximal to and distal to the sensor.

15. The method of claim 1, wherein the signal artifacts detection step comprises comparing a temperature proximal to and distal to the sensor.

16. The method of claim 1, wherein the signal artifacts detection step comprises monitoring a pressure or stress within the glucose sensor.

17. The method of claim 1, wherein the signal artifacts detection step comprises evaluating historical data for high amplitude noise above a predetermined threshold.

18. The method of claim 1, wherein the signal artifacts detection step comprises a Cone of Possibility Detection Method.

19. The method of claim 18, wherein the signal artifacts detection step comprises evaluating the data stream for a non-physiological rate-of-change.

20. The method of claim 1, wherein the signal artifacts detection step comprises monitoring the frequency content of the signal.

21. The method of claim 20, wherein the frequency-content monitoring step comprises performing an orthogonal basis function-based transform.

22. The method of claim 21, wherein the transform is a Fourier Transform or a wavelet transform.

23. The method of claim 1, wherein the artifacts replacement step comprises performing linear or non-linear regression.

24. The method of claim 23, wherein the artifacts replacement step comprises performing a trimmed mean.

25. The method of claim 1, wherein the artifacts replacement step comprises filtering using a non-recursive filter.

26. The method of claim 25, wherein non-recursive filtering step uses a finite impulse response filter.

27. The method of claim 1, wherein the artifacts replacement step comprises filtering using a recursive filter.

28. The method of claim 27, wherein the recursive filtering step uses an infinite impulse response filter.

29. The method of claim 1, wherein the artifacts replacement step comprises a performing a maximum average algorithm.

30. The method of claim 1, wherein the artifacts replacement step comprises performing a Cone of Possibility Replacement Method.

31. The method of claim 1, further comprising estimating future glucose signal values based on historical glucose values.

32. The method of claim 31, wherein glucose future estimation step comprises algorithmically estimating the future signal value based using at least one of linear regression, non-linear regression, and an auto-regressive algorithm.

33. The method of claim 32, further comprising measuring at least one of rate-of-change, acceleration, and physiologically feasibility of one or more signal values and subsequently selectively applying the algorithm conditional on a range of one of the measurements.

34. The method of claim 1, wherein the glucose sensor comprises an electrochemical cell comprising working, counter, and reference electrodes, and wherein the artifacts replacement step comprises normalizing the data signal based on baseline drift at the reference electrode.

35. The method of claim 1, wherein the signal artifacts replacement step is substantially continual.

36. The method of claim 1, wherein the signal artifacts replacement step is initiated in response to positive detection of signal artifacts.

37. The method of claim 1, wherein the signal artifacts replacement step is terminated in response to detection of negligible signal artifacts.

38. The method of claim 1, wherein the signal artifacts detection step comprises evaluating the severity of the signal artifacts.

39. The method of claim 38, wherein the severity evaluation is based on an amplitude of the transient non-glucose related signal artifacts.

40. The method of claim 38, wherein the severity evaluation is based on a duration of the transient non-glucose related signal artifacts.

41. The method of claim 38, wherein the severity evaluation is based on a rate-of-change of the transient non-glucose related signal artifacts.

42. The method of claim 38, wherein the severity evaluation is based on a frequency content of the transient non-glucose related signal artifacts.

43. The method of claim 38, wherein the artifacts replacement step comprises selectively applying one of a plurality of signal estimation algorithm factors in response to the severity of the signal artifacts.

44. The method of claim 43, wherein the plurality of signal estimation algorithm factors comprise a single algorithm with a plurality of parameters that are selectively applied to the algorithm.

45. The method of claim 43, wherein the plurality of signal estimation algorithm factors comprise a plurality of distinct algorithms.

46. The method of claim 43, wherein the step of selectively applying one of a plurality of signal estimation algorithm factors comprises selectively applying a predetermined algorithm that comprises a set of parameters whose values depend on the severity of the signal artifacts.

47. The method of claim 1, further comprising discarding at least some of the signal artifacts.

48. The method of claim 1, further comprising projecting glucose signal values for a time during which no data is available.

49. A method for processing data signals obtained from a glucose sensor, the method comprising:

obtaining a data stream from a glucose sensor;

detecting transient non-glucose related signal artifacts in the data stream that have a higher amplitude than a system noise; and

selectively applying one of a plurality of signal estimation algorithm factors to replace non-glucose related signal artifacts.

50. The method of claim 49, wherein the data signal obtaining step comprises receiving data from one of non-invasive, minimally invasive, and invasive glucose sensor.

51. The method of claim 49, wherein data signal obtaining step comprises receiving data from one of an enzymatic, chemical, physical, electrochemical, spectrophotometric, polarimetric, calorimetric, iontophoretic, and radiometric glucose sensor.

52. The method of claim 49, wherein the data signal obtaining step comprises receiving data from a wholly implantable glucose sensor.

53. The method of claim 49, wherein the signal artifacts detection step comprises testing for ischemia within or proximal to the glucose sensor.

54. The method of claim 53, wherein the ischemia testing step comprises obtaining oxygen concentration using an oxygen sensor proximal to or within the glucose sensor.

55. The method of claim 53, wherein the ischemia testing step comprises comparing a measurement from an oxygen sensor proximal to or within the glucose sensor with a measurement from an oxygen sensor distal from the glucose sensor.

56. The method of claim 53, wherein the glucose sensor comprises an electrochemical cell comprising a working electrode and a reference electrode, and wherein the ischemia-testing step comprises pulsed amperometric detection.

57. The method of claim 53, wherein the glucose sensor comprises an electrochemical cell comprising working, counter and reference electrodes, and wherein the ischemia-testing step comprises monitoring the counter electrode.

58. The method of claim 53, wherein the glucose sensor comprises an electrochemical cell comprising a working electrode, a counter electrode, and a reference electrode, and wherein the ischemia testing step comprises monitoring the reference electrode.

59. The method of claim 53, wherein the glucose sensor comprises an electrochemical cell comprising an anode and a cathode, and wherein the ischemia-testing step comprises monitoring the cathode.

60. The method of claim 49, wherein the signal artifacts detection step comprises monitoring a level of pH proximal to the sensor.

61. The method of claim 49, wherein the signal artifacts detection step comprises monitoring a temperature proximal to the sensor.

62. The method of claim 49, wherein the signal artifacts detection step comprises comparing a level of pH proximal to and distal to the sensor.

63. The method of claim 49, wherein the signal artifacts detection step comprises comparing a temperature proximal to and distal to the sensor.

64. The method of claim 49, wherein the signal artifacts detection step comprises monitoring the pressure or stress within the glucose sensor.

65. The method of claim 49, wherein the signal artifacts detection step comprises evaluating historical data for high amplitude noise above a predetermined threshold.

66. The method of claim 49, wherein the signal artifacts detection step comprises a Cone of Possibility Detection Method.

67. The method of claim 66, wherein the signal artifacts detection step comprises evaluating the signal for a non-physiological rate-of-change.

68. The method of claim 49, wherein the signal artifacts detection step comprises monitoring the frequency content of the signal.

69. The method of claim 68, wherein the frequency-content monitoring step comprises performing an orthogonal basis function-based transform.

70. The method of claim 69, wherein the transform is a Fourier Transform or a wavelet transform.

71. The method of claim 49, wherein the artifacts replacement step comprises performing linear or non-linear regression.

72. The method of claim 71, wherein the artifacts replacement step comprises performing a trimmed mean.

73. The method of claim 49, wherein the artifacts replacement step comprises filtering using a non-recursive filter.

74. The method of claim 73, wherein non-recursive filtering step uses a finite impulse response filter.

75. The method of claim 49, wherein the artifacts replacement step comprises filtering using a recursive filter.

76. The method of claim 75, wherein the recursive filtering step uses an infinite impulse response filter.

77. The method of claim 49, wherein the artifacts replacement step comprises a performing a maximum average algorithm.

78. The method of claim 49, wherein the artifacts replacement step comprises performing a Cone of Possibility algorithm.

79. The method of claim 49, further comprising estimating future glucose signal values based on historical glucose values.

80. The method of claim 79, wherein glucose future estimation step comprises algorithmically estimating the future signal value based using at least one of linear regression, non-linear regression, and an auto-regressive algorithm.

81. The method of claim 80, further comprising measuring at least one of rate-of-change, acceleration, and physiologically feasibility of one or more signal values and subsequently selectively applying the algorithm conditional on a range of one of the measurements.

82. The method of claim 49, wherein the glucose sensor comprises an electrochemical cell comprising working, counter, and reference electrodes, and wherein the artifacts replacement step comprises normalizing the data signal based on baseline drift at the reference electrode.

83. The method of claim 49, wherein the selective application step is substantially continual.

84. The method of claim 49, wherein the selective application step is initiated in response to positive detection of signal artifacts.

85. The method of claim 49, wherein the selective application step is terminated in response to detection of negligible signal artifacts.

86. The method of claim 49, wherein the signal artifacts detection step comprises evaluating the severity of the signal artifacts.

87. The method of claim 86, wherein the severity evaluation is based on an amplitude of the transient non-glucose related signal artifacts.

88. The method of claim 86, wherein the severity evaluation is based on a duration of the transient non-glucose related signal artifacts.

89. The method of claim 86, wherein the severity evaluation is based on a rate-of-change of the transient non-glucose related signal artifacts.

90. The method of claim 86, wherein the severity evaluation is based on a frequency content of the transient non-glucose related signal artifacts.

91. The method of claim 86, wherein the selective application step applies the one of a plurality of signal estimation algorithm factors in response to the severity of the signal artifacts.

92. The method of claim 91, wherein the plurality of signal estimation algorithm factors comprise a single algorithm with a plurality of parameters that are selectively applied to the algorithm.

93. The method of claim 91, wherein the plurality of signal estimation algorithm factors comprise a plurality of distinct algorithms.

94. The method of claim 91, wherein the selective application step comprises selectively applying a predetermined algorithm that comprises a set of parameters whose values depend on the severity of the signal artifacts.

95. The method of claim 49, further comprising the step of discarding at least some of the signal artifacts.

96. The method of claim 95, wherein the selective application step further comprises projecting glucose signal values for a time during which no data is available.

97. A system for processing data signals obtained from a glucose sensor, the system comprising:

a signal processing module comprising programming to monitor a data stream from the sensor over a period of time;

a detection module comprising programming to detect transient non-glucose related signal artifacts in the data stream that have a higher amplitude than a system noise; and

a signal estimation module comprising programming to replace at least some of the signal artifacts with estimated glucose signal values.

98. A system for processing data signals obtained from a glucose sensor, the system comprising:

a signal processing module comprising programming to monitor a data stream from the sensor over a period of time;

a detection module comprising programming to detect transient non-glucose related signal artifacts in the wherein the plurality of signal estimation algorithm factors comprise a plurality of distinct algorithms data stream that have a higher amplitude than a system noise; and

a signal estimation module comprising programming to selectively apply one of a plurality of signal estimation algorithm factors to replace non-glucose related signal artifacts.

99. An implantable glucose monitoring device, comprising:

a glucose sensor; and

a processor operatively linked to the sensor designed to receive a data stream from the sensor;

wherein the processor is programmed to analyze the data stream and to detect transient non-glucose related signal artifacts in the data stream that have a higher amplitude than system noise, and to replace at least some of the signal artifacts with estimated values.